

No.

200200146



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

New Zealand Institute for Crop & Food Research Ltd.

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

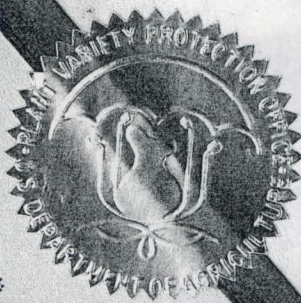
NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

PEA, FIELD

'Ariel'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this sixteenth day of September, in the year two thousand two.

Attest:



P. M. Johnson

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Arthur C. Freeman

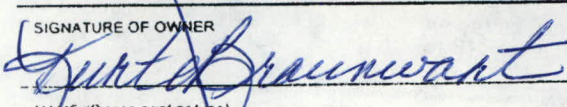
Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE
(Instructions and information collection burden statement on reverse)

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF OWNER New Zealand Institute for Crop & Food Research Ltd.		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME NZ 4L25	3. VARIETY NAME Ariel
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country) Private Bag 4704 Christchurch, New Zealand		5. TELEPHONE (Include area code) +64-3-325-6400	FOR OFFICIAL USE ONLY PVPO NUMBER 200200146
		6. FAX (include area code) +64-3-325-2074	
7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.) Ltd. (Limited)	8. IF INCORPORATED, GIVE STATE OF INCORPORATION	9. DATE OF INCORPORATION	FILING DATE April 23, 2002
10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. (First person listed will receive all papers) ProGene L.L.C.— Kurt Braunwart 860 S. Crestline Othello, WA 99344			FILING AND EXAMINATION FEES: FEE RECEIVED \$ 2705.00 DATE 4/23/2002 CERTIFICATION FEE: \$ 320.00 DATE 8/29/02
11. TELEPHONE (Include area code) (509) 488-3977	12. FAX (Include area code) (509) 488-5289	13. E-MAIL progene@cbnn.net	14. CROP KIND (Common Name) Field Pea
15. GENUS AND SPECIES NAME OF CROP Pisum sativum		16. FAMILY NAME (Botanical) Leguminosae	17. IS THE VARIETY A FIRST GENERATION HYBRID? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
18. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse) a. <input checked="" type="checkbox"/> Exhibit A. Origin and Breeding History of the Variety b. <input checked="" type="checkbox"/> Exhibit B. Statement of Distinctness c. <input checked="" type="checkbox"/> Exhibit C. Objective Description of Variety d. <input type="checkbox"/> Exhibit D. Additional Description of the Variety (Optional) e. <input checked="" type="checkbox"/> Exhibit E. Statement of the Basis of the Owner's Ownership f. <input checked="" type="checkbox"/> Voucher Sample (2,500 viable untreated seeds or, for tuber propagated varieties, verification that tissue culture will be deposited and maintained in an approved public repository) g. <input checked="" type="checkbox"/> Filing and Examination Fee (\$2,705), made payable to "Treasurer of the United States" (Mail to the Plant Variety Protection Office)		19. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD AS A CLASS OF CERTIFIED SEED? See Section 83(a) of the Plant Variety Protection Act <input type="checkbox"/> YES (If "yes", answer items 20 and 21 below) <input checked="" type="checkbox"/> NO (If "no", go to item 22)	
		20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES? IF YES, WHICH CLASSES? <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED	
		21. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? IF YES, SPECIFY THE <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED NUMBER 1,2,3, etc. (If additional explanation is necessary, please use the space indicated on the reverse.)	
22. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U. S. OR OTHER COUNTRIES? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES. (Please use space indicated on reverse.)		23. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT (PLANT BREEDER'S RIGHT OR PATENT)? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. (Please use space indicated on reverse.)	
24. The owners declare that a viable sample of basic seed of the variety will be furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate. The undersigned owner(s) is(are) the owner of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act. Owner(s) is(are) informed that false representation herein can jeopardize protection and result in penalties.			
SIGNATURE OF OWNER  NAME (Please print or type) Kurt Braunwart Representative of Applicant		SIGNATURE OF OWNER NAME (Please print or type)	
CAPACITY OR TITLE Managing Owner-ProGene L.L.C.	DATE 4/20/02	CAPACITY OR TITLE	DATE

INSTRUCTIONS

200200146

GENERAL: To be effectively filed with the Plant Variety Protection Office (PVPO), ALL of the following items must be received in the PVPO: (1) Completed application form signed by the owner; (2) completed exhibits A, B, C, E; (3) for a seed reproduced variety at least 2,500 viable untreated seeds, for a hybrid variety at least 2,500 untreated seeds of each line necessary to reproduce the variety, or for tuber reproduced varieties verification that a viable (in the sense that it will reproduce an entire plant) tissue culture will be deposited and maintained in an approved public repository; (4) check drawn on a U.S. bank for \$2,705 (\$320 filing fee and \$2,385 examination fee), payable to "Treasurer of the United States" (See Section 97.6 of the Regulations and Rules of Practice.) Partial applications will be held in the PVPO for not more than 90 days, then returned to the applicant as unfilled. Mail application and other requirements to Plant Variety Protection Office, AMS, USDA, Room 500, NAL Building, 10301 Baltimore Avenue, Beltsville, MD 20705-2351. Retain one copy for your files. All items on the face of the application are self explanatory unless noted below. Corrections on the application form and exhibits must be initialed and dated. **DO NOT** use masking materials to make corrections. If a certificate is allowed, you will be requested to send a check payable to "Treasurer of the United States" in the amount of \$320 for issuance of the certificate. Certificates will be issued to owner, not licensee or agent.

Plant Variety Protection Office

Telephone: (301) 504-5518

FAX: (301) 504-5291

Homepage: <http://www.ams.usda.gov/science/pvpo/pvp.htm>

ITEM

- 18a. Give:
- (1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method;
 - (2) the details of subsequent stages of selection and multiplication;
 - (3) evidence of uniformity and stability; and
 - (4) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified
- 18b. Give a summary of the variety's distinctness. Clearly state how this application variety may be distinguished from all other varieties in the same crop. If the new variety is most similar to one variety or a group of related varieties:
- (1) identify these varieties and state all differences objectively;
 - (2) attach statistical data for characters expressed numerically and demonstrate that these are clear differences; and
 - (3) submit, if helpful, seed and plant specimens or photographs (prints) of seed and plant comparisons which clearly indicate distinctness.
- 18c. Exhibit C forms are available from the PVPO Office for most crops; specify crop kind. Fill in Exhibit C (Objective Description of Variety) form as completely as possible to describe your variety.
- 18d. Optional additional characteristics and/or photographs. Describe any additional characteristics that cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the characteristics that are difficult to describe, such as plant habit, plant color, disease resistance, etc.
- 18e. Section 52(5) of the Act requires applicants to furnish a statement of the basis of the applicant's ownership. An Exhibit E form is available from the PVPO.
19. If "Yes" is specified (seed of this variety be sold by variety name only, as a class of certified seed), the applicant **MAY NOT** reverse this affirmative decision after the variety has been sold and so labeled, the decision published, or the certificate issued. However, if "No" has been specified, the applicant may change the choice. (See Regulations and Rules of Practice, Section 97.103).
22. See Sections 41, 42, and 43 of the Act and Section 97.5 of the regulations for eligibility requirements.
23. See Section 55 of the Act for instructions on claiming the benefit of an earlier filing date.

21. CONTINUED FROM FRONT (Please provide a statement as to the limitation and sequence of generations that may be certified.)

22. CONTINUED FROM FRONT (Please provide the date of first sale, disposition, transfer, or use for each country and the circumstances, if the variety (including any harvested material) or a hybrid produced from this variety has been sold, disposed of, transferred, or used in the U.S. or other countries.)

U.S.A. May 2001; release date and sale of seed for first commercial evaluation.

23. CONTINUED FROM FRONT (Please give the country, date of filing or issuance, and assigned reference number, if the variety or any component of the variety is protected by intellectual property right (Plant Breeder's Right or Patent).)

NOTES: It is the responsibility of the applicant/owner to keep the PVPO informed of any changes of address or change of ownership or assignment or owner's representative during the life of the application/certificate. There is no charge for filing a change of address. The fee for filing a change of ownership or assignment or any modification of owner's name is specified in Section 97.175 of the regulations. (See Section 101 of the Act, and Sections 97.130, 97.131, 97.175(h) of the Regulations and Rules of Practice.)

To avoid conflict with other variety names in use, the applicant must check the appropriate recognized authority. For example, for agricultural and vegetable crops, contact: Seed Branch, AMS, USDA, Room 213, Building 306, Beltsville Agricultural Research Center-East, Beltsville, MD 20705. Telephone: (301) 504-8089. <http://www.ams.usda.gov/lsg/seed/lsg-sd.htm>

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number for this collection of information is (0581-0055). The time required to complete this information collection is estimated to average 1.4 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, sexual orientation, or marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

S&T-470 (04-01) designed by the Plant Variety Protection Office with WordPerfect 6.0a. Replaces STD-470 (02-99) which is obsolete.

To: Mark Hermeling
USDA/PVPO
Washington, D.C.

From: Kurt Braunwart
ProGene, L.L.C.

April 14, 2002

Subject: Application for PVP of field pea variety Ariel
EXHIBIT A. Origin and Breeding History of the Variety

The original hybrid cross that Ariel (Number denotation NZ 4L 25) came from was made in 1990. The cross was between the following varieties:

88V15.1 x hybrid of (Bohatyr x Hadlee)

Bohatyr is a cultivar of common knowledge originating out of Eastern Europe while Hadlee is a cultivar released by Crop & Food Research in 1994.

88V15.1 is a semi-leafless green field pea breeding line originating from the Crop & Food Research field pea breeding program. Its parentage is as follows:

88415.1 originated from a cross of two hybrid crosses as follows:
(Solara x OSU 442-15) x (Rovar x Fek)

Solara is a known cultivar from the CEBECO program of Holland
OSU 442-15 is a germ plasm line from Oregon State University
Rovar is a known named variety
Fek is a known named variety from the wrinkled, vining pea industry for fresh processed peas.

From the original cross in March 1990. F1-F3 generations were multiplied and screened for resistance to the standard strain of Pea Seed-borne Mosaic virus (Pathovar P1) in a glasshouse at Lincoln, New Zealand. Resistant F4 progeny entered a field nursery at Lincoln in October 1991/92 where single plant selections were made from superior progeny plots. Superior progeny plots were bulked in 1992 in a field nursery conducted in Chester, UK. Small observation plot trials were conducted in New Zealand at Lincoln during 1993/94 where the bulk of 4L 25 was selected for regional trials. This bulk formed the nucleus seed stock of 4L 25. Larger plot trials were conducted in Canterbury, New Zealand between 1994/95 and 1998/99 and con-current seed purification and multiplication took place.

First yield trial testing of 4L 25 occurred in the US at Washington State University in 1997 and then with both WSU and ProGene in 1998. Yield trials and seed increases have continued in the US since that time with first commercial sale of seed for evaluating field agronomic characteristics, edible production and qualities occurred in May 2001.

Application for PVP is now being made in April 2002.

Criteria used for selecting Ariel as a variety to release in the Pacific Northwest of USA.

- **seed of uniform** roundness and size
- **seed size** – we wanted a variety producing a smaller seed size of 17 to 18 grams/100 seeds
- **erect upright plant growth** all the way to dry harvest
- **high pod set** for ease of harvest
- **resistance to bleaching** of the dark green cotyledon color to pale tan/white
- **yield**
- **degree of determinant**, we wanted something a little less determinant than European semi-leafless varieties

Statement of Stability and Uniformity

ProGene and its associates have found Ariel to be stable and uniform over the 4 years that we have been working with the variety and the 3 years of seed increases.

Statement of "No Variants"

ProGene and its associates have observed Ariel over the past three years of seed increases and have not observed any variants.



860 S Crestline
Othello, WA 99344
E-mail: progene@cbnn.net

Cellular: (509) 989-0405
Fax: (509) 488-5289
Phone: (509) 488-3977

To: Mark Hermeling
USDA/PVPO
Washington, D.C.

From: Kurt Braunwart
ProGene L.L.C.

July 20, 2002

Subject: Application for PVP of field pea variety Ariel
EXHIBIT B. Statement of Distinctness

The variety most similar to Ariel is Karita. Both Ariel and Karita are green seeded semi-leafless (af) spring field pea varieties. However there are some distinct differences.

Disease Resistance - Ariel is resistant to Fusarium wilt race 1 while Karita is not (WSU 2000, 2001).

Bleach Resistance - Ariel is significantly more resistance to the bleaching of the green cotyledon color than is Karita.

Seed size - In every comparison case out of the replicated yield trials the seed size of Ariel seed is smaller than that of Karita.

(Replacement for Exhibit B to replace the letter submitted with the application on April 20, 2002.

AS 100-11 10-10-02
10200-1111 10-10-02
10200-1111 10-10-02

Washington State University - 2000 Progress Report - Field Exp on Dry Pea, Winter Pea, and Chickpea

Table 2. Summary of Green Dry Pea Yield Trial, 2000 (0001)

1 of 2

Cultivar	Origin	Leaf Af	Plant Le	Disease Fw	Disease Aph	Days to Flower	Days to Maturity	Nodes to Fst Flwr	Pods/ Peduncle	Pod Ht green ..cm..	Pod Ht mature ..cm..	Pod Ht index	Plant Ht green ..cm..	Plant Ht mature ..cm..	Plant Ht index	Weight 100 Seed ..g..
PS810323	X95P122	-	-	+	4	56	105	15	2	46	0	0.00	67	27	0.40	18.4
Lifter	....	+	-	+	3	55	109	14	2	60	0	0.00	72	24	0.34	19.7
PRO 8612-2G	....	-	-	+	3	56	104	16	2	54	50	0.92	60	59	0.98	20.4
CEB 1158	....	-	-	+	3	56	102	14	2	59	43	0.81	56	54	0.96	22.9
PS710308	X94P059	+	-	+	4	54	102	12	2	38	0	0.00	49	18	0.36	20.4
PS610152	X93P022	-	-	+	4	50	102	13	2	41	38	0.93	56	54	0.98	20.4
Espace	....	-	-	+	3	56	105	20	2	62	58	0.94	69	68	0.99	17.0
PS710255	X94P035	-	-	+	3	54	106	13	2	36	0	0.00	60	26	0.43	17.4
PS610150	X93P022	-	-	+	4	50	103	14	2	39	36	0.94	55	51	0.93	21.1
Karita	....	-	-	-	3	52	101	17	2	55	58	1.00	66	67	1.00	22.9
Astina	....	-	-	+	3	53	102	15	2	52	48	0.94	67	66	0.98	20.4
Franklin	....	+	-	+	4	55	101	14	2	37	0	0.00	45	16	0.36	18.3
Joel	....	+	+	+	3	50	101	12	1	76	0	0.00	95	35	0.37	22.4
PS7101119	X94P116	-	-	+	3	56	105	17	2	50	45	0.92	62	56	0.90	19.5
PS710137	X93P206	-	-	+	3	49	104	12	2	30	31	1.00	52	51	0.97	23.9
Toledo	....	-	-	+	3	54	101	16	2	54	48	0.88	63	64	1.00	21.2
Majoret	....	-	-	-	3	56	102	18	1	61	62	1.00	74	75	1.00	19.5
Scuba	....	-	-	+	3	55	101	16	2	54	51	0.95	74	71	0.96	17.6
CEB1166	....	-	-	+	2	56	101	19	2	70	65	0.93	75	71	0.94	17.1
PS710263	X94P041	-	-	+	4	51	103	12	2	32	17	0.54	68	42	0.62	19.8
Phantom	....	-	-	+	3	54	101	13	2	33	36	1.00	45	45	1.00	22.8
PS610324	X93P192	-	-	+	4	55	103	17	2	52	53	1.00	62	61	0.98	22.2
NZ4L28	....	-	-	+	3	56	102	16	2	53	51	0.98	67	67	1.00	16.7
Alaska 81	+	+	+	2	44	100	9	1	43	0	0.00	87	41	0.49	18.8
PS710048	X92P202	-	-	+	4	56	103	15	2	58	50	0.86	66	63	0.96	22.5

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Table 2. Summary of the Advanced Green Dry Pea Yield Trial, 2000 (0001) Continued

Cultivar	Origin	Leaf Af	Plant Le	Disease Fw	Disease Aph	Days to Flower	Days to Maturity	Nodes to Fst Flwr	Pods/ Peduncle	Pod Ht green ..cm..	Pod Ht mature ..cm..	Pod Ht index	Plant Ht green ..cm..	Plant Ht mature ..cm..	Plant Ht index	Weight 100 Seed ..g..
CEB 1170	....	-	-	+	2	53	102	16	2	67	65	0.98	77	78	1.00	22.4
PS7101126	X94P191	-	-	-	3	56	109	17	2	56	18	0.32	75	34	0.46	20.6
PS710508	X94P026	-	-	+	3	50	101	13	2	38	36	0.96	65	61	0.93	20.9
PS710416	X94P110	-	-	+	3	55	103	18	2	58	43	0.75	68	52	0.77	20.0
<i>Ariel</i> NZ4L25	....	-	-	+	3	56	102	16	2	52	51	1.00	65	64	0.99	15.2
Columbian	....	+	+	+	3	42	101	10	1	51	0	0.00	98	33	0.33	19.4
PS7101123	X94P191	-	-	+	3	57	103	16	2	42	41	0.96	51	50	0.97	20.8
Grand Mean						53	103	15	2	50	34	0.70	66	51	0.80	20.1
C.V. %						1.4	1.8	6.7	13.5	12.8	14.7	22.4	8.1	1.0	7.7	2.2
LSD(0.05)						0.8	2	1	0.3	7	5	0.20	6	4	0.10	0.5

Yield data on Table 1 are means of three replications at each location.

Af = leaf type; +=normal leaf, -=afila or semileafless type.

Le = plant type; +=tall plant type, -=short plant type.

Fw = Fusarium wilt race 1; +=resistant, -=susceptible

Aph = Aphanomyces; 1=no symptoms, 2=some symptoms, 3=moderate symptoms, 4=severe symptoms, 5=dead.

Agronomic data on Table 2 are means of three replications at the Pullman, Wa location.

Pod height was measured at the green pod stage and at harvest maturity.

Pod height index was determined by dividing the value at harvest maturity by the green pod stage value.

Plant height was measured at the green pod stage and at harvest maturity.

Plant height index was determined by dividing the value at harvest maturity by the green pod stage value.

Washington State University - 2002 Progress Report - Fall Expt on Dry Pea, Winter Pea, Lentil, and Chickpea

Table 2. Agronomic Data from the Advanced Green Dry Pea Yield Trial, 2001 (0101)

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Cultivar	Origin	Leaf Type	Plant Type	Disease Fw	Disease Aph	Days to Flower	Days to Maturity	Nodes to Fst Flwr	Pods/ Peduncle	Pod Ht (green) ..cm..	Pod Ht (mature) ..cm..	Pod Ht Index	Plant Ht (green) ..cm..	Plant Ht (mature) ..cm..	Plant Ht Index	Weight 100 Seed ..g..
CEB 1171	-----	-	-	+	3	54	94	13	2	43	30	0.80	58	43	0.75	25.2
Bluebird	-----	-	-	+	3	53	91	15	2	43	51	1.00	59	61	1.00	24.4
Phantom	-----	-	-	+	3	52	92	14	2	44	35	0.82	48	56	1.00	26.8
PS710048	X92P202	-	-	-	3	56	90	17	2	61	0	0.00	74	26	0.38	24.1
PS810323	X95P122	-	-	+/-	3	55	92	15	2	49	0	0.00	66	22	0.29	20.1
PS810191	X94P164	-	-	+	3	56	92	20	2	64	0	0.00	71	32	0.43	20.9
PS610152	X93P022	-	-	+	3	50	92	14	2	43	0	0.00	61	30	0.43	22.1
Toledo	-----	-	-	+	3	52	90	16	2	60	53	0.81	74	79	1.00	27.0
Karita	-----	-	-	-	3	51	94	17	2	51	61	1.00	72	75	1.00	25.8
Hero	-----	-	-	-	3	54	92	16	2	53	32	0.49	68	43	0.64	23.5
PRO 98106	-----	-	-	-	3	47	88	13	2	41	22	0.50	61	41	0.63	20.9
PS810240	X94P106	-	-	+	3	56	92	19	2	75	0	0.00	82	34	0.46	22.5
CEB 1170	-----	-	-	+	3	54	93	16	2	70	51	0.80	83	62	0.82	28.3
PS810162	X94P058	-	-	+	4	47	93	12	2	36	33	0.94	62	53	0.80	23.4
Cruiser	-----	-	-	+	3	54	93	17	2	62	50	0.96	81	72	0.94	22.4
Ariel	-----	-	-	+	3	54	92	18	2	65	58	0.84	74	75	0.98	20.3
Verdi	-----	-	-	+/-	3	57	95	18	2	63	47	0.80	72	63	0.95	21.4
Espace	-----	-	-	+	3	54	90	18	2	53	56	1.00	64	78	1.00	23.7
PS710255	X94P035	-	-	+	3	55	96	13	2	37	0	0.00	68	26	0.40	19.5
Montero	-----	-	-	+/-	3	56	94	19	2	61	38	0.70	73	52	0.79	21.0
Alaska 81	X78G126	+	+	+	3	43	94	11	1	58	0	0.00	120	40	0.34	20.3
Lifter	X93P045	+	-	+	3	55	104	14	2	71	8	0.06	85	28	0.28	22.5
Joel	X84F172	+	+	+	2	46	91	13	2	84	0	0.00	131	42	0.34	24.1
Columbian	-----	+	+	+	3	42	96	8	1	35	0	0.00	110	35	0.35	21.1
PS710508	X94P026	-	-	+/-	3	46	93	12	2	40	0	0.00	69	28	0.34	20.9

Table 2. Agronomic Data from the Advanced Green Dry Pea Yield Trial, 2001 (0101) Continued

<u>Cultivar</u>	<u>Origin</u>	<u>Leaf Type</u>	<u>Plant Type</u>	<u>Disease Fw</u>	<u>Disease Aph</u>	<u>Days to Flower</u>	<u>Days to Maturity</u>	<u>Nodes to Fst Flwr</u>	<u>Pods/ Peduncle</u>	<u>Pod Ht (green) ..cm..</u>	<u>Pod Ht (mature) ..cm..</u>	<u>Pod Ht Index</u>	<u>Plant Ht (green) ..cm..</u>	<u>Plant Ht (mature) ..cm..</u>	<u>Plant Ht Index</u>	<u>Weight 100 Seed ..g..</u>
PS7101119	X94P116	-	-	+/-	3	58	94	18	2	58	17	0.18	65	31	0.40	21.7
PS710416	X94P110	-	-	+	3	54	93	18	2	57	0	0.00	75	29	0.43	23.3
Majoret	-----	-	-	-	3	54	92	19	2	73	65	0.95	76	81	1.00	24.3
PS610324	X93P192	-	-	+	3	54	95	19	2	63	33	0.50	75	47	0.58	28.0
Franklin	X93P046	+	-	+	3	56	90	15	2	49	0	0.00	56	20	0.34	21.4
Grand Mean						52	93	16		55	25	0.46	74	47	0.66	
C.V. (%)						2	2	8		8	29	....	9	13	....
LSD ($\alpha=0.05$)						2	3	2		6	10	0.21	9	8	0.13	

Leaf type; + = normal leaf, - = *afila* or semileafless type.

Plant type; + = tall plant type, - = short plant type.

Fw = Fusarium wilt race 1; + = resistant, - = susceptible

Aph = Aphanomyces; 1 = no symptoms, 2 = some symptoms, 3 = moderate symptoms, 4 = severe symptoms, 5 = dead.

Agronomic data are means of three replications at Pullman, WA.

Pod and plant height were measured at the green pod stage and at harvest maturity.

Pod and plant height indices were determined by dividing the value at harvest maturity by the green pod stage value.

04-20-2002

Ariel / Karita Cotelydon Bleach Comparison

TREATMENT	Pro1999	Pro2000	Pro2001	AVERAGE
Ariel	0.50	0.50	0.01	0.34
Karita	23.00	6.50	4.00	11.17
AVGS	11.75	3.50	2.01	5.75

ANOVA SUMMARY TABLE

SOURCE	df	SS	MS	F	SIGNF
BLOCKS	2	110.18	55.09	1.07	NS
TREATMENTS	1	175.93	175.93	3.41	NS
ERROR	2	103.15	51.58		
TOTAL	5	389.26			

THE F-VALUE WAS NOT SIGNIFICANT. LSD COMPUTED MAY HAVE NO MEANING.

LSD(5%) = 25.23

CV= 124.86%

LSD SUMMARY TABLE:

TREATMENT	OBS. MEAN	
Ariel	0.34	A
Karita	11.17	A

LOS VME -1 100:02

N2DV - THE BALD
RECEIVED

04-18-2002

Ariel / Karita Grams per 100 seeds comparison

TREATMENT	UI3yrs	WSU2yrs	Pro3yrs	AVERAGE
Ariel	16.10	17.80	17.40	17.10
Karita	22.40	24.35	24.35	23.70
AVGS	19.25	21.08	20.88	20.40

ANOVA SUMMARY TABLE

SOURCE	df	SS	MS	F	SIGNF
BLOCKS	2	4.01	2.00	37.31	SIGNF
TREATMENTS	1	65.34	65.34	1216.51	SIGNF
ERROR	2	0.11	0.05		
TOTAL	5	69.46			

LSD(5%) = 0.81

CV= 1.14%

LSD SUMMARY TABLE:

TREATMENT	OBS. MEAN	
Ariel	17.10	A
Karita	23.70	B

instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MD 20705

EXHIBIT C
(Pea)

OBJECTIVE DESCRIPTION OF VARIETY
PEA (*Pisum sativum* L.)

NAME OF APPLICANT(S) Representative-ProGene L.L.C. New Zealand Institute for Crop & Food Research	FOR OFFICIAL USE ONLY
ADDRESS (Street and No. or RD No., City, State, and Zip Code) 860 S. Crestline Othello, WA 99344	PVPO NUMBER 200200146
	VARIETY NAME Ariel
	TEMPORARY OR EXPERIMENTAL DESIGNATION NZ 4L25

PLEASE READ ALL INSTRUCTIONS CAREFULLY: Place the appropriate number that describes the varietal character of this variety in the boxes below. Place a zero in the first box (e.g. or) when number is either 99 or less or 9 or less respectively. Data for quantitative plant characters should be based on a minimum of 100 plants. Comparative data should be determined from varieties entered in the same trial. Royal Horticultural Society or any recognized color standard may be used to determine plant colors; designate system used: _____

Please answer all questions for your variety; lack of response may delay progress of your application.

1. TYPE:

1=Garden 2=Field 3=Edible-podded 4=Other (SPECIFY): _____

2. MATURITY:

Node number of first bloom: No. of days processing Heat Units

No. of days Earlier than physiological maturity ~~1=Alaska WR~~ 2=Thomas Laxton WR 3=Little Marvel
1=Columbian
 No. of days Later than 4=Wando 5=Alderman WR 6=Austrian Winter 7=Other

3. PLANT HEIGHT:

Cm. High (69.9 4 years avg.)

Cm. Shorter than ☒ Name of check cultivar Columbian

Cm. Taller than ☒ Name of check cultivar Hero

4. VINE:

1 = Slim (Alaska)
2 = Medium (Thomas Laxton WR)
3 = Heavy (Alderman)

Habit: 1=Determinate 2=Indeterminate Stockiness: 1.5=Intermediate

* Branching: 1 = None (Alaska) 2 = 1-2 Branches (Little Marvel) 3 = More than 2 Branches (Dwarf Gray Sugar)
1.5*=some branching but less than 1 per plant.

Internodes: 1 = Straight 2 = Zig Zag Number of nodes

(22.6)

12

5. LEAFLETS: None Present-Afilia or Semi-Leafless plant type

NZ 4L25 Ariel

☐ 0 Color: 1 = Light Green (Alaska WR) 2 = Medium Green (Thomas Laxton WR) 3 = Dark Green (Alderman)
4 = Other (Specify) _____ 5 = Blue Green 6 = Yellow Green 0 = Not Applicable

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☐ 0 Wax: 1 = None 2 = Light 3 = Medium
4 = Heavy 0 = Not Applicable

☐ 0 1 = Not Marbled 2 = Marbled (Alaska)
0 = Not Applicable

☐ 0 Number of Leaflet Pairs: 1 = Not Paired 2 = One 3 = Two 4 = Three or More 0 = Not Applicable

☒ 2 Leaflet Type: 1 = Leafless 2 = Semi 3 = Normal

6. STIPULES:

☐ 2 1 = Lacking 2 = Present ☒ 2 1 = Not Clasping 2 = Clasping

☐ 1 1 = Not Marbled 2 = Marbled ☐ Size (Compared with leaflets):
1 = Smaller 2 = Same
3 = Larger 0 = Not Applicable

☐ 0 Color (Compared with Leaflets): 1 = Lighter 2 = Same 3 = Darker 0 = Not Applicable

☐ Color: 1=Light-Green 2=Medium-Green 3=Dark-Green 4=Blue-Green 5=Yellow-Green 6=Other _____

Color Chart Value: $\frac{1999 \ 137 \ A}{2001 \ 137 \ C}$

Select the Color Chart Used to Determine Values.

☒ X Royal Horticulture Society Colour Chart
____ Munsell Color Chart
____ Other _____

☒ 2 Stipule Size: 1=Small 2=Medium 3=Large

Please provide comparative varieties (check varieties) and stipule color.

	Variety (1)	Variety (2)	Variety (3)
Variety Name:	<u>Cruiser</u>	<u>Columbian</u>	<u>Hero</u>
Stipule Size:	<u>similar to Ariel</u>	<u>Similar to Ariel</u>	<u>larger than Ariel</u>
Color Chart Value:	<u>137 A</u>	<u>137 A</u>	<u>138 A/ 137 C (lighter than Ariel)</u>

7. FLOWER COLOR:

☐ 6 Venation ☐ 1 Standard ☐ 1 Wing ☐ 6 Keel

Venation-pronounced yellow green

Keel-pale yellow green

1 = White
2 = Greenish
3 = Lavender
4 = Purple
5 = Red
6 = Other (specify) _____

3. PODS:

NZ 4L25 Ariel

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☐ 1 Shape: 1 = Straight 2 = Slightly Curved 3 = Curved
☐ 2 End: 1 = Pointed (Alderman) 2 = Blunt (Alaska)
☐ Color: 1 = Light Green (Alaska WR) 2 = Medium Green 3 = Dark Green (Alderman)
 4 = Other (Specify) 144 A 5 = Blue 6 = Purple 7 = Yellow
☐ 2 Surface: 1 = Smooth 2 = Rough ☐ 2 Surface: 1 = Shiny 2 = Dull
☐ 3 Borne: 1 = Single 2 = Double 3 = Single and Double 4 = Single, Double, & Triple 5 = Double & Triple
 6 = Triple 7 = Other (Specify) _____ 8 = Quad, Single, Double, Triple 9 = Quad
☐ 0 ☐ 6 CM. Length 5.87 avg. cm *MAH 8-12-02* ☐ 1 ☐ 0 MM. Width (Between Sutures) 10.7 avg. mm ☐ 0 ☐ 6 No. Seeds Per Pod 5.91 avg. seeds/pod

SEEDS (95-100 Tenderometer):

☐ Color: 1 = Light Green 2 = Green 3 = Dark Green 4 = Other (Specify) _____ 5 = Yellow
 6 = Brown 7 = Yellow green

eive: % ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ Average

SEEDS (Dry, Mature):

☐ 4 Shape: 1 = Flattened 2 = Angular 3 = Oval 4 = Rounded 5 = Splashed 6 = Flecked 7 = Bicolored

☐ 1 Surface: 1 = Smooth 2 = Dimpled ☐ 2 Surface: 1 = Shiny 2 = Dull
 3 = Wrinkled

☐ 1 Color Pattern: 1 = Monocolor 2 = Mottled 3 = Striped 4 = Dotted

☐ 4 Primary Color* ☐ Secondary Color
 (148C) (RHSC Chart on 2001 seed)
 1 = Creamy - White 2 = Cream & Green 3 = Light Green
 4 = Medium Green 5 = Dark Green 6 = Blue-Green
 7 = Yellow 8 = Brown 9 = Red 10 = Gray 11 = Black
 12 = Salmon 13 = Purple 14 = Tan 15 = White
 16 = Pink 17 = Yellow-Green

☐ 2 Hilum Floor Color: 1 = White 2 = Tan ☐ 1 Cotyledon Color:* 1 = Green 2 = Yellow
 3 = Black (137C) 3 = Orange 4 = Cream
 (RHSC Chart)

☐ 1 ☐ 7 Grams per 100 Seeds
 (17.12 avg. 4 year average)

*Royal Horticulture Society Colour Chart
2001 Seed

10. DISEASE: (0=Not Tested; 1=Susceptible; 2=Resistant)

NZ 4L25 Ariel

PLEASE INDICATE THE SPECIFIC RACE OR STRAIN TESTED

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- | | |
|--|---|
| <input checked="" type="checkbox"/> 2 Fusarium Wilt - Race 1 | <input type="checkbox"/> Fusarium Wilt (Near Wilt) - Race 2 |
| <input type="checkbox"/> Stripe Rust (<i>Puccinia striiformis</i>) | <input type="checkbox"/> Loose Smut (<i>Ustilago tritici</i>) |
| <input type="checkbox"/> Tan Spot (<i>Pyrenophora tritici-repentis</i>) | <input type="checkbox"/> Flag Smut (<i>Urocystis agropyri</i>) |
| <input type="checkbox"/> Halo Spot (<i>Selenophoma donacis</i>) | <input type="checkbox"/> Common Bunt (<i>Tilletia tritici</i> or <i>T. laevis</i>) |
| <input type="checkbox"/> <i>Septoria nodorum</i> (Glume Blotch) | <input type="checkbox"/> Dwarf Bunt (<i>Tilletia controversa</i>) |
| <input type="checkbox"/> <i>Septoria avenae</i> (Speckled Leaf Disease) | <input type="checkbox"/> Karnal Bunt (<i>Tilletia indica</i>) |
| <input type="checkbox"/> <i>Septoria tritici</i> (Speckled Leaf Blotch) | <input checked="" type="checkbox"/> 1 Powdery Mildew (<i>Erysiphe graminis</i> f. sp. <i>tritici</i>) |
| <input type="checkbox"/> Scab (<i>Fusarium</i> spp.) | <input type="checkbox"/> "Snow Molds" |
| <input type="checkbox"/> "Black Point" (Kernel Smudge) | <input type="checkbox"/> Common Root Rot (<i>Fusarium</i> , <i>Cochliobolus</i> and <i>Bipolaris</i> spp.) |
| <input type="checkbox"/> Barley Yellow Dwarf Virus (BYDV) | <input type="checkbox"/> Rhizoctonia Root Rot (<i>Rhizoctonia solani</i>) |
| <input type="checkbox"/> Soilborne Mosaic Virus (SBMV) | <input type="checkbox"/> Black Chaff (<i>Xanthomonas campestris</i> pv. <i>translucens</i>) |
| <input type="checkbox"/> Wheat Yellow (Spindle Streak) Mosaic Virus | <input type="checkbox"/> Bacterial Leaf Blight (<i>Pseudomonas syringae</i> pv. <i>syringae</i>) |
| <input type="checkbox"/> Wheat Streak Mosaic Virus (WSMV) | <input type="checkbox"/> Other (SPECIFY) |
| <input checked="" type="checkbox"/> 1 Other (SPECIFY) Enation | <input type="checkbox"/> Other (SPECIFY) |
| <input checked="" type="checkbox"/> 1 Other (SPECIFY) Aphonomeces-moderate | <input type="checkbox"/> Other (SPECIFY) |
| <input checked="" type="checkbox"/> 2 Other (SPECIFY) | <input type="checkbox"/> Other (SPECIFY) |

PSBMV - Pea Seede Borne Mosaic Virus

11. INSECT: (0=Not Tested; 1=Susceptible; 2=Resistant)

- | | |
|--|--|
| <input checked="" type="checkbox"/> 0 Aphids | <input type="checkbox"/> Other (SPECIFY) |
|--|--|

12. Additional information on any item above, or general comments that may aid in identification:

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). The information is held confidential until the certificate is issued (7 U.S.C. 2426).

EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

1. NAME OF APPLICANT(S) New Zealand Institute for Crop and Food Research Ltd.	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER NZ 4L25	3. VARIETY NAME Ariel
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP, and Country) Private Bag 4704 Christchurch, New Zealand	5. TELEPHONE (include area code) +64-3-325-6400	6. FAX (include area code) +64-3-325-2074
7. PVPO NUMBER 200200146		

8. Does the applicant own all rights to the variety? Mark an "X" in the appropriate block. If no, please explain

☒ YES ☐ NO

9. Is the applicant (individual or company) a U.S. National or a U.S. based company? If no, give name of country

☐ YES ☒ NO

New Zealand

10. Is the applicant the original owner? ☒ YES ☐ NO If no, please answer one of the following:

a. If the original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. National(s)?

☐ YES ☐ NO If no, give name of country

b. If the original rights to variety were owned by a company(ies), is (are) the original owner(s) a U.S. based company?

☐ YES ☒ NO If no, give name of country

New Zealand

11. Additional explanation on ownership (If needed, use the reverse for extra space):

Attached please find a FAX of a letter written and signed by Crop and Food Research atesting to their ownership of the Green Field Pea Variety "Ariel"

PLEASE NOTE:

Plant variety protection can only be afforded to the owners (not licensees) who meet the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.
2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.
3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed the final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definitions.

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 6 minutes per response, including the time for reviewing the instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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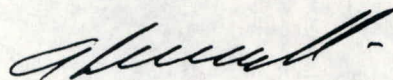
19 January 2000

To whom it may concern

This is to certify that the two field pea (*Pisum sativum*) cultivars currently known as 4L25 and Crusader (formally breeding line 4L28) submitted by Mr Kurt Braunwart of Progene LLC) for Plant Variety Protection in the USA were bred, and are owned by the New Zealand Institute for Crop & Food Research Ltd.

Progene LLC have been appointed Production and marketing Licencee for the USA for both cultivars and are authorized by us to apply for Plant Variety Protection in this territory and submit all necessary documentation to the PVP office.

Yours sincerely



Adrian Russell
Contract Manager – Non-Cereal Arable Crop Development
Russella@crop.cri.nz